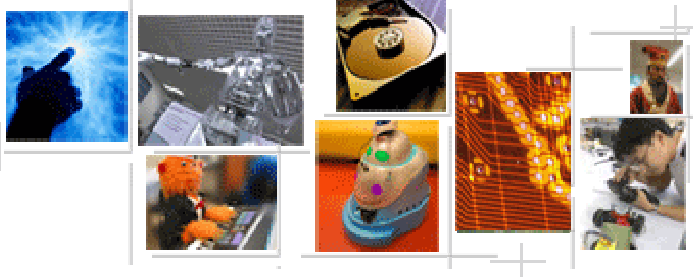


# Workshop on Hybrid and Embedded Systems: Technologies and Applications



Feb 21–22, 2006 (Tue & Wed)

Convention Hall 1, G/F  
Core Building, Science Park  
Shatin, Hong Kong

*Jointly organized by*  
**Hong Kong Science and Technology Parks Corporation (HKSTP)**  
**Department of Automation and Computer-Aided Engineering, CUHK**

*With support of* Chess - UC Berkeley, ISIS - Vanderbilt University  
ESCHER, ESI - HKUST, Department of Computer Science - HKUST

## Introduction

In recent years, Hybrid and Embedded Systems (HEMS) have been widely applied in a great diversity of complex engineering applications such as networking and communication systems, medical devices, manufacturing systems, power networks, automobiles, aircraft and transportation systems. Some examples are the Wireless Sensor Network for Surveillance and Intelligent Building/Transportation, and Integrated Software Systems for Factory Automation and Middleware Synthesis. Embedded systems are special-purpose computing systems designed to perform real-time computation for interacting with the surrounding environment in order to enable automation and enhance efficiency. Hybrid systems have been shown to be useful models for performing model-based design of embedded systems in which discrete and continuous system are tightly coupled.

The high-profile and safety-critical nature of HEMS applications have fostered a large and growing body of work on formal methods for model-based design of embedded systems. They include mathematical logic, computational models and methods, and automated reasoning tools supporting the formal specification and verification of performance requirements.

The Workshop on Hybrid and Embedded Systems offers a general overview of the field of hybrid and embedded systems ranging from modeling, over analysis and verification, to model-integrated computing and design tool development. The Workshop targets engineers, researchers, executives and graduate students from the field, as well as those who are of general interest in HEMS.

## Organizing Committee

Prof. T. John Koo (Chair - US)	Department of Electrical Engineering and Computer Science, Vanderbilt University
Prof. Yeung Yam (Chair - HK)	Chairman, Department of Automation and Computer-Aided Engineering, CUHK
Dr. David Young	Director, Embedded Systems Institute, HKUST
Prof. Michael Y. Wang	Department of Automation and Computer-Aided Engineering, CUHK
Ms. Helen Chung	Senior Manager, The Hong Kong Science and Technology Parks Corporation
Mr. Nathan Liu	Assistant Manager, The Hong Kong Science and Technology Parks Corporation

## Speakers:

### Prof. Gabor Karsai



Gabor Karsai is an Associate Professor of Electrical Engineering and Computer Science at Vanderbilt University, and a Senior Research Scientist at the Institute for Software Integrated Systems. Prof. Kasai has over twenty-five years of experience in software engineering. He conducts research in the design and implementation of embedded systems, in programming tools for visual programming environments, in the theory and practice of model-integrated computing, and in resource management and scheduling systems.

Prof. Karsai received his BSc, MSc, and Dr. Techn. degrees from the Technical University of Budapest, in 1982, 1984 and 1988, respectively, and his PhD from Vanderbilt University in 1988. He has published over 100 papers, and he is the co-author of four patents. He has managed several large DARPA projects in the recent past: advanced scheduling and resource management algorithms that resulted in a technology being transitioned maintenance scheduling applications, fault-adaptive control technology that is being transitioned into unmanned aerial vehicle programs, and model-based integration of embedded systems whose resulting tools are being used in embedded software development tool chains worldwide. He is a senior member of the IEEE.

### Prof. T. John Koo



T. John Koo is an Assistant Professor of the Department of Electrical Engineering and Computer Science, Vanderbilt University, and a Senior Research Scientist at the Institute for Software Integrated Systems. He is an Associated Faculty of the National Science Foundation ITR Center for Hybrid and Embedded Software Systems. He was a Visiting Faculty in the Department of Electrical Engineering and Computer Sciences of the University of California at Berkeley in 2002. In 2001, he held a Research Specialist position in the Electronics Research Laboratory of the University of California at Berkeley. He was a Visiting Fellow in the Department of Electrical Engineering of the University of Pennsylvania in 2000. In 1998, he held a Consultant position at the Stanford Research Institute International, Menlo Park, CA.

From 1995 to 2002, he was the founder and project leader of the Berkeley Aerial Robot project. In 1994, he was a Graduate Research Fellow in the Signal and Image Processing Institute of the University of Southern California.

Prof. Koo received the B.Eng. degree in Electronic Engineering and the M.Phil. degree in Information Engineering from the Chinese University of Hong Kong in 1992 and 1994, respectively, and the Ph.D degree in Electrical Engineering from the University of California at Berkeley in 2000. His research interests include embedded software, model-integrated computing, hybrid systems, nonlinear control, robotics, sensor networks and scientific computing.

Prof. Koo received the Nation Science Foundation Faculty Early CAREER Development Award in 2005 and the Distinguished M.Phil. Thesis Award of the Faculty of Engineering, the Chinese University of Hong Kong, in 1994. Prof. Koo has coauthored over 50 technical papers and book chapters. He is the Associate Editor of the IEEE International Conference on Decision and Control, Seville, Spain, 2005. He is the program committee member of the 9th International Workshop on Hybrid Systems: Computation and Control and the 9th International Workshop on Software and Compilers for Embedded Systems. He was the Publicity Chair of the International Workshop on Hybrid Systems: Computation and Control, Philadelphia, PA, 2004. He is a senior member of the IEEE and a member of Sigma Xi.

## Prof. Shankar Sastry



S. Sastry became Chair, Department of Electrical Engineering and Computer Sciences, University of California, Berkeley in January, 2001, and held that position until 2004. Prior to that, he served as Director of the Information Technology Office at DARPA. From 1996-1999, he was the Director of the Electronics Research Laboratory at Berkeley, an organized research unit on the Berkeley campus conducting research in computer sciences and all aspects of electrical engineering. During his directorship from 1996-1999, Prof. Sastry also holds a joint professorship in the Departments of Electrical Engineering and Computer Sciences and Bioengineering.

Prof. Sastry received his Ph.D. in 1981 from the University of California, Berkeley. He was at the faculty of MIT as assistant professor from 1980-1982 and at Harvard University as a chaired Gordon Mc Kay professor in 1994. He has held visiting appointments at the Australian National University in Canberra, the University of Rome, Scuola Normale, and the University of Pisa, the CNRS laboratory LAAS in Toulouse (poste rouge), Professor Invite at Institut National Polytechnique de Grenoble (CNRS laboratory VERIMAG), and a Vinton Hayes Visiting fellow at the Center for Intelligent Control Systems at MIT. His areas of research are embedded and autonomous software, computer vision, and computation in novel substrates such as DNA, nonlinear and adaptive control, robotic telesurgery, control of hybrid systems, embedded systems, sensor networks and biological motor control.

Prof. Sastry has coauthored over 250 technical papers and six books and has served as associate editor for numerous publications. Prof. Sastry was elected into the National Academy of Engineering in 2001 and pioneering contributions to the design of hybrid and embedded systems. He also received the President of India Gold Medal in 1977, the IBM Faculty Development Award for 1983-1985, the NSF Presidential Young Investigator Award in 1985, the Eckman Award of the American Automatic Control Council in 1990, an M.A. (honoris causa) from Harvard in 1994, Fellow of the IEEE in 1994, the distinguished Alumnus Award of the Indian Institute of Technology in 1999, and the David Marr prize for the best paper at the International Conference in Computer Vision in 1999.

## Prof. Janos Sztipanovits



Prof. Janos Sztipanovits is currently the E. Bronson Ingram Distinguished Professor of Engineering in the Electrical Engineering and Computer Science Department of Vanderbilt University. He is founding director of the Institute for Software Integrated Systems. Between 1999 and 2001, he worked as program manager and acting deputy director of DARPA Information Technology Office. During the past two decades, Prof. Sztipanovits has conducted research on Model-Integrated Computing, structurally adaptive systems, and embedded software and systems. He has published over 160 papers and co-authored two books.

Prof. Sztipanovits graduated from the Technical University of Budapest in 1970. He received the degree of Candidate of Technical Sciences from the Hungarian Academy of Sciences in 1980, and the distinguished doctor degree (Golden Ring of the Republic) in 1982. He is a Fellow of the IEEE.

## Program:

### Day 1 (February 21, 2006)

09:15 - 09:30	Registration	
09:30 - 09:45	Welcome Speech	- Ir. S. W. Cheung, VP of HKSTP - Prof. Billy So, Associate PVC of CUHK
09:45 - 10:30	Introduction to Hybrid & Embedded Systems	- Prof. Shankar Sastry
10:30 - 12:30	Integrated Software Systems	- Prof. Janos Sztipanovits
12:30 - 13:30	Lunch	
13:30 - 15:30	Design Tool Framework	- Prof. Gabor Karsai
15:30 - 17:30	Embedded Hybrid Systems	- Prof. T. John Koo

### Day 2 (February 22, 2006)

09:15 - 09:30	Registration	
09:30 - 11:30	Networked Hybrid Systems	- Prof. Shankar Sastry
11:30 - 12:30	Open Forum	Prof. Gabor Karsai, Prof. T. John Koo, Prof. Shankar Sastry, Prof. Janos Sztipanovits (Moderator: Dr. On-ching Yue, Science Advisor, Innovation & Technology Commission)
12:30 - 13:30	Lunch	
13:30 - 15:00	Tour of HKSTP	

## General Information

<b>Date:</b>	February 21 – 22, 2006	
<b>Venue:</b>	Convention Hall 1, G/F, Core Building, Science Park, Shatin	
<b>Fee:</b>	<b>Standard</b> – HK\$1,000	
	<b>Student</b> – HK\$500	<b>(On limited quota for full time students in tertiary institutions)</b>

## Enquiry:

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Website: <http://www.acae.cuhk.edu.hk/HEMS2006/home.html>

## Transportation:

**By Train:** Take KCRC, get off at University Station and take KMB 272K

For other options of traveling to HKSTP, please visit:

[http://www.hkstp.org/english/hksp/hksp\\_location/hksp\\_loc\\_sitemap.html#howtogetthere](http://www.hkstp.org/english/hksp/hksp_location/hksp_loc_sitemap.html#howtogetthere)

### Science Park Sitemap:

[http://www.hkstp-ic.org/DLOAD/HKSP\\_Sitemap.jpg](http://www.hkstp-ic.org/DLOAD/HKSP_Sitemap.jpg)